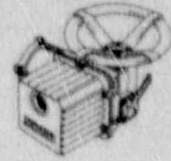


Limitorque

# Limitorque Corporation

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#4  
10/4

September 29, 1989

*Ross*

U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

Re: Limitorque Corporation  
Part 21 Notification

Subject: SMB-000 and SMB-00 Torque Switches

Attention: Director, Nuclear Reactor Regulation

Gentlemen:

Pursuant to the requirements of Title 10 of the Code of Federal Regulations Part 21 herein provided is notification of potential common failure of SMB-000 and SMB-00 cam type torque switches supplied prior to 1981 and 1976 respectively, as detailed in the attached letter. In order to expedite the notification of the facilities affected, Limitorque has made simultaneous written notice to both the commission and the attached list of nuclear utility customers.

Signed:

I. E. Wilkinson  
Vice President of Engineering

LIMITORQUE CORPORATION

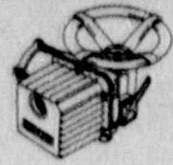
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September 29, 1989

SUBJECT: 10 CFR Part 21 Notification

Gentlemen:

Please be advised Limitorque has concluded its evaluation of two SMB-000 torque switch failures, at Clinton Nuclear Power Station and Detroit Edison's Fermi Unit No. 2. We have determined that these failures do represent a potential common mode failure and are therefore a reportable defect in accordance with the Code of Federal Regulations Title 10, Part 21.

### Identification of Basic Component

The component of concern is the SMB-000 and SMB-00 cam-type torque switch with fiber spacers under the contact bridge (see attachment #1).

### Nature of the Defect

A single SMB-000 torque switch failure occurred at two plants as a result of the stationary contact screws loosening on the side of the torque switch which had fiber spacers. The fiber spacers were installed on one side of the torque switch to provide equal spring pack compression in each direction to balance the torque switch.

Two types of failure modes have been reported. In one case only one screw came loose eliminating electrical continuity with the contact bridge resulting in a premature trip point on the torque switch. The second case occurred when both stationary contact screws loosened and the contact fingers were raised while continuity was maintained. This resulted in a condition where greater spring pack compression was required before the electrical contacts would open, in this case the electric motor went to locked rotor before the actuator could produce sufficient output torque to break the torque switch contacts. In both cases, the stationary contact screws that loosened were on the contacts which had the fiber spacers.

A similar torque switch failure had occurred in 1980 at the Susquehanna Plant. At that time, it was hypothesized that the cause of the loosening of the contact screws was a result of the fiber spacers taking a set and releasing pre-load from the contact screws, thus allowing the screws to loosen. At this time a Part 21 determination concluded that this was not a reportable incident as it was a single failure of a component which had a large population in use in the industry. In response to this concern Limitorque modified the torque switch design to replace the fiber spacers with additional metallic contact bridges to insure that no further difficulties would be encountered.

#### Equipment Effected

All SMB-000 and SMB-00 actuators with cam-type torque switches using the fiber spacer could potentially experience this type of failure. SMB-000 actuators with serial number less than 326670 and SMB-00's with serial numbers less than 233218 were originally manufactured with cam-type torque switches, using fiber spacers. Any replacement torque switches which may have been purchase for SMB-000's after 1980 or for SMB-00's after 1976 would not have included the fiber spacers and therefore do not contain a reportable defect.

#### Licensee Corrective Action

Limitorque recommends that those SMB-000 and SMB-00 actuators with the cam-type torque switch with fiber spacer be replaced. To date, we have received reports of three failures of this torque switch configuration which represents less than one tenth of one percent of the total population of these switches. Consequently, we are recommending that these switches be replaced during the next available maintenance period.

Page 3  
September 29, 1989  
Part 21 Notification

The Limitorque Corrective Action

Limitorque modified the SMB-000 torque switch in 1980 and the SMB-00 torque switch in 1976, therefore all new torque switches manufactured after this period are not subject to this problem.

In the event that you should have any questions concerning this report, please contact either Rob Laird or Mike Bailey in our Nuclear Support Department at our Lynchburg facility.

Very truly yours,

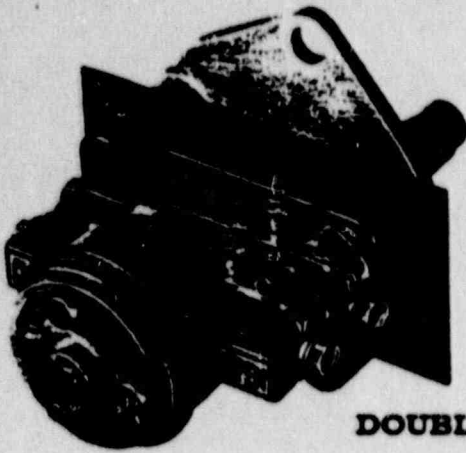


I. E. Wilkinson  
Vice President of Engineering

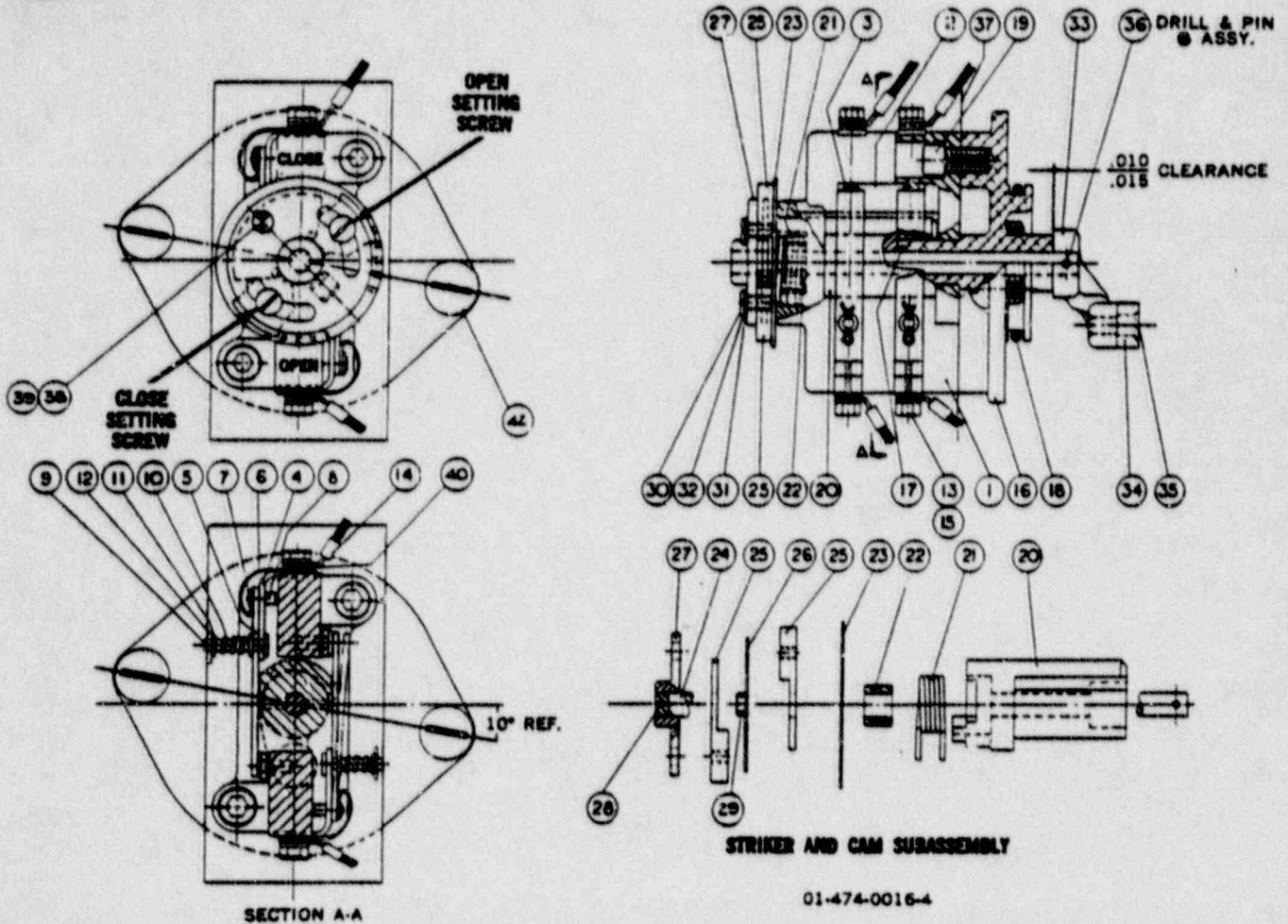
LIMITORQUE CORPORATION

Attachment

cc: T. Mignogna  
R. Kornsey  
10 CFR 21 - 16 file



**DOUBLE TORQUE SWITCH SMB-00/SMB-000**



01-474-0016-4

PC. NO.	NO. REQD.	DESCRIPTION	PC. NO.	NO. REQD.	DESCRIPTION	PC. NO.	NO. REQD.	DESCRIPTION
1	1	TERMINAL BLOCK	15	4	LOCKWASHER SHAKEPROOF	29	1	#4 SWAGE NUT
2	2	CONTACT BRIDGE	16	1	TORQUE Q.W. MTG. BRACKET	30	2	PAN HD. SCREW #8-32 x 1/4 LG. SLOTTED
3	4	CONTACT SCREW	17	1	"O" RING	31	2	LOCKWASHER SHAKEPROOF
4	4	FINGER HOLDER	18	1	"O" RING	32	2	FLATWASHER 1/4 I.D. x 1/4 O.D. x .032 THK.
5	4	FINGER	19	2	SOC. HD. CAP SCR. 1/4-20 x 1/4 LG.	33	1	ARM
6	4	SHUNT	20	1	CAM	34	1	ROLLER
7	4	SHUNT WASHER 1/4 O.D. 1/2 I.D. 1/2 THK.	21	1	TORSION SPRING	35	1	ROLLER PIN
8	4	RIVET	22	1	SPRING MANDREL	36	1	GROOVE PIN 1/8 DIA. x 1/2
9	4	FINGER SPRING STUD	23	1	DIAL	37	1	ARC BARRIER
10	4	COMPRESSION SPRING	24	1	SHAFT	38	1	PAN HD. SCR. #6-40 x 1/4
11	8	SPRING CUP WASHER	25	2	STRIKER	39	1	LOCKWASHER, EXTERNAL TOOTH
12	4	COTTER PIN (1/4 x 1/4)	26	1	TORQUE LIMITING PLATE	40	4	WASHER 1/4 O.D. x 1/4 I.D. x 1/2 THK.
13	4	HEX. HD. MACH. SCR. #10-32 x 1/4	27	1	STRIKER HUB	42	2	RD. HD. MACH. SCR. 1/4-18 x 1/4
14	4	RING TORQUE CONNECTOR 18" #16 AWG TYPE TU PIGTAIL	28	1	ROLL PIN 1/4 φ x 1/2			

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